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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,626	03/11/2004	Wei-xian Zhang	LUNX-102US	6660

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EXAMINER

HOEV, BETSEY MORRISON

ART UNIT	PAPER NUMBER
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1724

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/798,626

Applicant(s)

ZHANG, WEI-XIAN

Examiner

Betsey M. Hoey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7 and 8 is/are rejected.
- 7) ☒ Claim(s) 5, 6 and 9-12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/11/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the drawings submitted on March 11, 2004 appear to have informal labels (Fig. 1, Fig. 2, etc.). Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

2. Claim 2 is objected to because of the following informalities: "suspension iron particles" should be "suspension of iron particles". Appropriate correction is required.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2 and 3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 is considered indefinite because it is unclear what grinding or milling does. The claim recites preparing a suspension of iron particles in aqueous solution, and then grinding or milling the suspension to produce the same. Did grinding or milling result in any change? Claim 3 is rejected because it depends on claim 2.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,857,810 to Cantrell et al. Cantrell et al. teach a method for remediating contaminated soil and groundwater comprising making a stable colloidal suspension containing particles such as zero-valent iron particles, and injecting the suspension into a subsurface zone.

Claims 4 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Cantrell et al. (see above). Cantrell et al. teach a composition for remediating contaminated soil and groundwater comprising a stable colloidal suspension containing particles such as zero-valent iron particles. The colloids containing zero-valent iron particles are 2 +/- 1 μm . By definition:

col-loid (kŏl' oid) *n.* 1. *Chemistry* a. A system in which finely divided particles, which are approximately 10 to 10,000 angstroms in size, are dispersed within a continuous medium in a manner that prevents them from being filtered easily or settled rapidly.

Therefore, the zero-valent iron particles within the colloids of Cantrell et al. are approximately 1-1000 nm in size. The compositions of Cantrell et al. contain less than 30% by weight of iron particles.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,787,034 to Noland et al. in view of U.S. Patent No. 6,242,663 to Ponder et

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al. Noland et al. disclose compositions for treating soil and groundwater contamination which are prepared by mixing an aqueous suspension of a supported catalyst (see Example 3). The supported catalyst comprises zero valent iron on a support. The claims differ from Noland et al. by reciting that a dispersant of iron particles 10 μm or less is ground or milled to reduce the iron particle size to a maximum of 100 nm.

Ponder et al. disclose compositions that are analogous to the compositions of Noland et al. because both solve the same problem in substantially the same manner. That is, both the compositions of Ponder et al. and Noland et al. solve the problem of groundwater contamination by remediating the groundwater with supported zero-valent iron. The zero-valent iron of Ponder et al. is finely grained and may be from 5 to 50 nm in size. The small size of the iron of Ponder et al. is advantageous because it provides high surface area for the decontamination reactions to take place.

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the present invention was made, to have used zero-valent iron in the size recited in the instant claim when making the composition of Noland et al., in view of Ponder et al., in order to provide a high surface area for decontamination reactions.

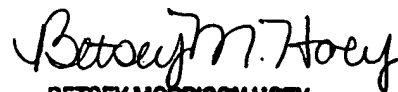
9. Claims 5, 6 and 9-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

Claims 5 and 6 would be allowable if rewritten in independent form including all of the limitations of claim 4, because the prior art of record fails to teach, disclose, or fairly suggest a composition for treating contaminated soil or water consisting of a colloidal suspension of zero-valent iron particles having an average size less than 100 nm, which is stabilized by a block or graft copolymer containing anchoring and stabilizing chains. It is submitted that while Cantrell et al. disclose the addition of a non-Newtonian fluid which may be soluble polymers, there is no suggestion of adding the specific copolymer recited in instant claim 5 as a stabilizer.

Claims 9-12 would be allowable if rewritten in independent form including all of the limitations of claim 8, because the prior art of record fails to teach, disclose, or fairly suggest a method for preparing a suspension of zero-valent iron particles including a step of introducing a block or graft copolymer containing anchoring and stabilizing chains as a stabilizer, in combination with the steps of instant claim 8.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betsey Hoey whose telephone number is **(571) 272-1158**. The examiner can normally be reached on Mondays, Tuesdays, and Thursdays. The examiner's supervisor, Mr. Duane Smith, may be reached at (571) 272-1166. Any inquiry of general nature may be directed to the Group receptionist at (571) 272-0987. The centralized fax number for the Group is (703) 872-9306. The examiner Rightfax number is (571) 273-1158.



BETSEY MORRISON HOEY
PRIMARY EXAMINER

June 20, 2005